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1. *Extracts of a Letter from Dr. LIVINGSTONE to Dr. KIRK.*

"Near Lake 'Bangweolo,' 8th July, 1868.

... After enumerating things needed, such as cloth, beads, &c., which are to be sent to Ujiji by first opportunity, Dr. Livingstone adds:—"I have had no news from anywhere for two years and upwards. The Arabs have all been overflowing in kindness. I borrow this paper from Mohammed Bogarib, for I am up here without any. I am greatly obliged by the Sultan's letter, and beg you to say so to his highness. I don't know which of his subjects has served me most, where all have shown kindness and goodwill.

"For Captain Fraser and our friends at Zanzibar, I may say I have found what I believe to be the sources of the Nile between 10° and 12° s., or nearly in the position assigned them by Ptolemy.

"It is not one source from a lake, but upwards of twenty of them. Lake Liemba, which possibly is an arm of Tanganyika, has four rivers flowing into it. One I measured, and found it to be 294 feet—say 100 yards—high, and waist deep, and flowing fast in September. No rain had fallen since May 12; elsewhere it almost requires canoes. This has eleven good-sized 'burns' flowing into it. Taking these four rivers as one line of drainage (a fifth from Marungu must be added), then the Chambeze flows from the side into the centre of a great valley, and receives three streams as large as the Isis at Oxford or Avon at Hamilton. The Chambeze enters Bangweolo Lake and receives two streams; then changes its name to Luapula, and flowing north receives two streams about fifty yards broad each. Luapula receives one, and enters Moero Lake to receive five streams, one is eighty yards broad and always requires canoes. On leaving Moero it is called Lualaba, which receives two good-sized streams, and it forms Ulenge, either a lake with many islands or a division with many streams, which are taken up by the Lufira, a large river which, by five branches, drains the west side of the great valley, which probably is that of the Nile. I have still to follow down the Lualaba, and see whether, as the natives assert, it passes Tanganyika to the west, or enters it and finds an exit by the river called Loanda into Lake Chowambe, which I conjecture to be that discovered by Mr. Baker.

"I shall not follow the Lualaba by canoes, as we did the Zambesi from near the Victoria Falls to Kebrabassa; that was insanity, and I am not going to do any more mad things.

"If any letters have come for me, please send them on to Ujiji till further notice. I send to your care a letter to Lord Clarendon, one for Miss Livingstone, and one for Sir Roderick Murchison, and I trust you will forward them safely at your convenience in proper envelopes.

"Yours &c.,

(Signed) "DAVID LIVINGSTONE."

2. *Despatch from Dr. LIVINGSTONE to the Earl of CLARENDON.*

"Near Lake Bangweolo, South Central Africa,
July, 1868.

"MY LORD,

"When I had the honour of writing to you in February, 1867, I had the impression that I was then on the watershed between the Zambesi and either the Congo or the Nile. More extended observation has since convinced me of the essential correctness of that impression; and from what I have seen, together with what I have learned from intelligent natives, I think that I may safely assert that the chief sources of the Nile, arise between 10° and 12° south latitude, or nearly in the position assigned to them by Ptolemy, whose River Rhaptus is probably the Rovuma. Aware that others have been mistaken, and

laying no claim to infallibility, I do not yet speak very positively, particularly of the parts west and north-west of Tanganyika, because these have not yet come under my observation; but if your Lordship will read the following short sketch of my discoveries, you will perceive that the springs of the Nile have hitherto been searched for very much too far to the north. They rise some 400 miles south of the most southerly portion of the Victoria Nyanza, and, indeed, south of all the lakes except Bangweolo.

"Leaving the valley of the Loangwa, which enters the Zambesi at Zumbo, we climbed up what seemed to be a great mountain mass, but it turned out to be only the southern edge of an elevated region, which is from 3000 to 6000 feet above the level of the sea. This upland may roughly be said to cover a space south of Lake Tanganyika, of some 350 miles square. It is generally covered with dense or open forest, has an undulating, sometimes hilly, surface; a rich soil; is well watered by numerous rivulets, and, for Africa, is cold. It slopes towards the north and west, but I have found no part of it under 3000 feet of altitude. The country of Usango, situated east of the space indicated, is also an upland, and affords pasturage to the immense herds of cattle of the Basango, a remarkably light-coloured race, very friendly to strangers. Usango forms the eastern side of a great but still elevated valley. The other or western side is formed by what are called the Kone Mountains, beyond the copper-mines of Katanga. Still further west, and beyond the Kone range or plateau, our old acquaintance the Zambesi, under the name of Jambaji, is said to rise. The southern end of the great valley inclosed between Usango and the Kone range is between 11° and 12° s. It was rarely possible there to see a star, but accidentally awaking one morning between 2 and 3 o'clock, I found one which showed latitude $11^{\circ} 56'$ s., and we were then fairly on the upland. Next day we passed two rivulets running north. As we advanced, brooks, evidently perennial, became numerous. Some went eastward to fall into the Loangwa; others went north-west to join the River Chambeze. Misled by a map calling this river in an off-hand manner 'Zambezi, eastern branch,' I took it to be the southern river of that name; but the Chambeze, with all its branches, flows from the eastern side into the centre of the great upland valley mentioned, which is probably the valley of the Nile. It is an interesting river, as helping to form three lakes, and changing its name three times in the 500 or 600 miles of its course. It was first crossed by the Portuguese, who always inquired for ivory and slaves, and heard of nothing else. A person who collected all, even the hearsay geography of the Portuguese, knew so little actually of the country that he put a large river here running 3000 feet up-hill, and called it New Zambesi.

I crossed the Chambeze in $10^{\circ} 34'$ s., and several of its confluent south and north, quite as large as the Isis at Oxford, but running faster, and having hippopotami in them. I mention these animals because in navigating the Zambezi I could always steer the steamer boldly to where they lay, sure of finding not less than 8 feet of water. The Chambeze runs into Lake Bangweolo, and on coming out of it assumes the name Luapula. The Luapula flows down north past the town of Cazembe, and 12 miles below it enters Lake Moero. On leaving Moero at its northern end by a rent in the mountains of Rua, it takes the name Lualaba, and passing on N.W., forms Ulenge in the country west of Tanganyika. I have seen it only where it leaves Moero, and where it comes out of the crack in the mountains of Rua, but am quite satisfied that even before it receives the River Sofunso from Marungu, and the Soburi from the Baloba country, it is quite sufficient to form Ulenge, whether that is a lake with many islands, as some assert, or a sort of punjaub—a division into several branches, as is maintained by others. These branches are all gathered up by the Lufira—a large river, which by many confluent drains the western side of the great valley. I have not seen the Lufira, but pointed out west of 11° s., it is there asserted always to

require canoes. This is purely native information. Some intelligent men assert that when the Lufira takes up the water of Ulenge, it flows N.N.W. into Lake Chowambe, which I conjecture to be that discovered by Mr. Baker. Others think that it goes into Lake Tanganyika at Uvira, and still passes northward into Chowambe by a river named Loanda. These are the parts regarding which I suspend my judgment. If I am in error there and live through it, I shall correct myself. My opinion at present is if the large amount of water I have seen going north does not flow past Tanganyika on the west, it must have an exit from the Lake, and in all likelihood by the Loanda.

"Looking back again to the upland, it is well divided into districts, Lobisa, Lobemba, Ubengu, Itawa, Lopere, Kabuire, Marungu, Lunda or Londa, and Rua; the people are known by the initial 'Ba' instead of the initial 'Lo' or 'U' for country. The Arabs soften 'Ba' into 'Wa,' in accordance with their Suaheli dialect; the natives never do. On the northern slope of the upland, and on the 2nd of April, 1867, I discovered Lake Liemba; it lies in a hollow, with precipitous sides 2000 feet down; it is extremely beautiful, sides, top, and bottom being covered with trees and other vegetation. Elephants, buffaloes, and antelopes feed on the steep slopes, while hippopotami, crocodiles, and fish swarm in the waters. Guns being unknown, the elephants, unless sometimes deceived into a pitfall, have it all their own way. It is as perfect a natural paradise as Xenophon could have desired. On two rocky islands men till the land, rear goats, and catch fish; the villages ashore are embowered in the palm-oil palms of the West Coast of Africa. Four considerable streams flow into Liemba, and a number of brooks (*Scotticè*, 'trout burns'), from 12 to 15 feet broad, leap down the steep bright red clay-schist rocks, and form splendid cascades, that made the dullest of my attendants pause and remark with wonder. I measured one of the streams, the Lofu, 50 miles from its confluence, and found it at a ford 294 feet, say 100 yards broad, thigh and waist deep and flowing fast over hardened sandstone flag in September—the last rain had fallen on the 12th of May. Elsewhere the Lofu requires canoes. The Louzua drives a large body of smooth water into Liemba, bearing on its surface duckweed and grassy islands; this body of water was 10 fathoms deep. Another of the four streams is said to be larger than the Lofu, but an over-officious headman prevented my seeing more of it and another than their mouths. The lake is not large, from 18 to 20 miles broad, and from 35 to 40 long; it goes off N.N.W. in a river-like prolongation two miles wide, it is said, to Tanganyika: I would have set it down as an arm of that lake, but that its surface is 2800 feet above the level of the sea, while Speke makes that 1844 feet only. I tried to follow the river-like portion, but was prevented by a war which had broken out between the Chief of Itawa and a party of ivory traders from Zanzibar. I then set off to go 150 miles south, then west, till past the disturbed district, and explore the west of Tanganyika; but on going 80 miles I found the Arab party, showed them a letter from the Sultan of Zanzibar, which I owe to the kind offices of his Excellency Sir Bartle Frere, Governor of Bombay, and was at once supplied with provisions, cloth, and beads; they showed the greatest kindness and anxiety for my safety and success. The heads of the party readily perceived that a continuance of hostilities meant shutting up the ivory market, but the peace-making was a tedious process, requiring 3½ months; I was glad to see the mode of ivory and slave trading of these men, it formed such a perfect contrast to that of the ruffians from Kilwa, and to the ways of the atrocious Portuguese from Tette, who were connived at in their murders by the Governor D'Almeida.

"After peace was made I visited Msama, the Chief of Itawa; and, having left the Arabs, went on to Lake Moero, which I reached on the 8th September, 1867. In the northern part Moero is from 20 to 33 miles broad. Further south it is at least 60 miles wide, and it is 50 miles long. Ranges of tree-

covered mountains flank it on both sides, but at the broad part the western mountains dwindle out of sight. Passing up the eastern side of Moero we came to Cazembe, whose predecessors have been three times visited by Portuguese. His town stands on the north-east bank of the lakelet Mofwe; this is from two to three miles broad and nearly four long. It has several low, reedy islets, and yields plenty of fish—a species of perch. It is not connected with either the Luapula or Moero. I was forty days at Cazembe's, and might then have gone on to Bangweolo, which is larger than either of the other lakes; but the rains had set in, and this lake was reported to be very unhealthy. Not having a grain of any kind of medicine, and, as fever, without treatment, produced very disagreeable symptoms, I thought that it would be unwise to venture where swelled thyroid gland, known among us as Derbysbire-neck, and elephantiasis (scroti) prevail. I then went north for Ujiji, where I have goods, and, I hope, letters: for I have heard nothing from the world for more than two years: but when I got within 12 days of Tanganyika, I was brought to a stand-still by the superabundance of water in the country in front. A native party came through, and described the country as inundated so as often to be thigh and waist deep, with dry sleeping-places difficult to find. This flood lasts till May or June. At last I became so tired of inactivity that I doubled back on my course to Cazembe.

"To give an idea of the inundation which, in a small way, enacts the part of the Nile lower down, I had to cross two rivulets which flow into the north end of Lake Moero; one was 30, the other 40 yards broad, crossed by bridges; one had a quarter, the other half a mile of flood on each side. Moreover, one, the Luao, had covered a plain abreast of Moero, so that the water on a great part reached from the knees to the upper part of the chest. The plain was of black mud, with grass higher than our heads. We had to follow the path which, in places, the feet of passengers had worn into deep ruts. Into these we every now and then plunged and fell, over the ancles in soft mud, while hundreds of bubbles rushed up, and, bursting, emitted a frightful odour. We had four hours of this wading and plunging—the last mile was the worst; and right glad we were to get out of it to the sandy beach of Moero and bathe in the clear tepid waters. In going up the bank of the lake we first of all forded four torrents, thigh-deep; then a river 80 yards wide, with 300 yard of flood on its west bank, so deep we had to keep to the canoes till within 50 yards of the higher ground; then four brooks, from 5 to 15 yards broad. One of them, the Chungu, possesses a somewhat melancholy interest, as that on which poor Dr. Lacerda died. He was the only Portuguese visitor who had any scientific education, and his latitude of Cazembe's town on the Chungu being 50 miles wrong, probably reveals that his mind was clouded with fever when he last observed, and any one who knows what that implies will look on his error with compassion. The Chungu went high on the chest, and one had to walk on tiptoe to avoid swimming. As I crossed all these brooks at both high and low water, I observed the difference to be from 15 to 18 inches, and from all the perennial streams the flood is a clear water. The state of the rivers and country made me go in the very lightest marching order; took nothing but the most necessary instruments, and no paper except a couple of note-books and the Bible. On unexpectedly finding a party going to the coast, I borrowed a piece of paper from an Arab, and the defects unavoidable in the circumstances you will kindly excuse. Only four of my attendants would come here; the others, on various pretences, absconded. The fact is, they are all fired of this everlasting tramping, and so verily am I. Were it not for an inveterate dislike to give in to difficulties, without doing my utmost to overcome them, I would abscond too. I comfort myself by the hope that by making the country and people better known I am doing good; and by imparting a little knowledge occasionally, I may be working in accordance with the plans of an all-embracing Providence which now forms part of the belief of all the more

intelligent of our race, my efforts may be appreciated in the good time coming yet.

"I was in the habit of sending my observations to the Cape Observatory, where Sir Thomas Maclear, the Astronomer-Royal, and the Assistant-Astronomer, Mr. Mann, bestowed a great deal of gratuitous labour on them in addition to the regular duties of the Observatory. They tested their accuracy in a variety of ways, which those only who are versed in the higher mathematics can understand or appreciate. The late Earl of Ellesmere publicly said of a single sheet of these most carefully-tested geographical positions, that they contained more true geography than many large volumes. While the mass of observations which went to the Royal Observatory at the Cape required much time for calculation, I worked out a number in a rough way, leaving out many minute corrections, such as for the height of the thermometer and barometer, the horizontal parallax and semi-diameter of planets, using but one moon's semi-diameter and horizontal parallax for a set of distances, though of several hours' duration; corrections for the differences of proportional logarithms, &c.; and, with these confessedly imperfect longitudes, made and sent home sketch-maps to give general ideas of the countries explored. They were imperfect, as calculated and made in the confusion of the multitude of matters that crowd on the mind of an explorer, but infinitely better than many of the published maps. Sir Thomas Maclear, for instance, says that short of a trigonometric survey, no river has been laid down so accurately as the Zambesi; and Mr. Mann, after most careful examination of the series of chronometric observations which more than once ran from the sea and Tette up to Lake Nyassa, says that any error in the longitude cannot possibly amount to four minutes.

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"My borrowed paper is done, or I should have given a summary of the streams which, flowing into the Chambeze, Luapula, Lualaba, and the lakes, may be called sources. Thirteen, all larger than the Isis at Oxford, or Avon at Hamilton, run into one line of drainage; five into another, and five into a third receptacle—twenty-three in all. Not having seen the Nile in the north, I forbear any comparison of volume. I trust that my labours, though much longer than I intended, may meet with your Lordship's approbation.

"I have, &c.,

(Signed)

"DAVID LIVINGSTONE.

"P.S. Always something new from Africa; a large tribe lives in underground houses in Rua. Some excavations are said to be 30 miles long, and have running rills in them—a whole district can stand a siege in them. The 'writings' therein I have been told by some of the people are drawings of animals, and not letters, otherwise I should have gone to see them. People very dark, well made, and outer angle of eyes slanting inwards."

3. *Extracts from a Letter of Dr. LIVINGSTONE to the PRESIDENT.*

"MY DEAR SIR RODERICK,

"Near Lake Bangweolo, 8th July, 1868.

"My letter to Lord Clarendon will explain what I have been doing, and why I can only give you a leaf out of my Note-book. The sources of the Nile are undoubtedly between 10° and 12° s., not one or two, but upwards of twenty of them rise south of all the lakes except Bangweolo. The great valley is exactly like the valleys of the Congo and Zambesi, and you have been seeking the sources too far to the north. I have yet to follow down the three lines of drainage into which the twenty-three sources converge, and do not speak very positively as to whether they flow past Tanganyika to the